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The behavior, attitudes, and social class of 48 Negro mothers and 48 Negro fathers were related to the development of their fifth grade boys' flexible thinking, defined as the ability to consider alternative means to a given end. The parents were interviewed at home and asked to teach their sons four tasks. Linear relationships were found linking flexible thinking with mother commands, father love, father total words, social class, and two father factors, "powerlessness versus powerfulness" and "rigid, absolute versus warm, sympathetic standards." Quadratic relationships were found linking flexible thinking with mother manipulation, mother commands, mother pointing, father manipulation, and three father factors, "active versus ignoring role with children," "discouraging versus tolerating physical aggression in children," and "powerlessness versus powerfulness." (Author/JS)

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Abstract

The behavior, attitudes, and social class of forty-eight Negro mothers and forty-eight Negro fathers was related to the development of their fifth grade boys' flexible thinking, defined as the ability to consider alternative means to a given end.

Linear relationships were found linking flexible thinking with mother commands, father love, father total words, social class, and two father factors, "powerlessness vs. powerfulness," and "rigid, absolute vs. warm, sympathetic standards." Quadratic relationships were found linking flexible thinking with mother manipulation, mother commands, mother pointing, father manipulation, and three father factors, "active vs. ignoring role with children," "discouraging vs. tolerating physical aggression in children," and "powerlessness vs. powerfulness."

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CHILDREARING ANTECEDENTS OF FLEXIBLE THINKING[1]

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Traditionally one of the major goals of a liberal education has been flexible thinking, that is, the ability to consider alternative means to a given end. The educated man ought to be able to view issues and problems from a variety of standpoints. He should be capable of considering alternative solutions to problems which confront him. A mark of the uneducated man, in contrast, is his quick defense of the simplistic and proverbial.

Psychologists have long assumed that parent-child interactions are important in determining personality; more recently they have come to believe that such interactions may influence cognitive development as well (Bloom, 1964). This study is an outgrowth of the latter idea. It is an attempt to discover whether parental behaviors, parental attitudes, and social class contribute to the development of flexible thinking in boys.

The childrearing antecedents of flexible thinking have been investigated by Barclay and Cusumano (1967), Dawson (1963), Seder (1957), and Witkin, Dyk, Faterson, Goodenough, and Karp (1962). Taken together the findings of these

investigators seem to show that flexible thinking is stifled by four childrearing practices. First, flexible thinking is limited by overprotective, overcontrolling behavior by mothers. Second, the development of flexible thinking is suppressed by severe punishment. Third, "too good" a home, that is, one where all argument and controversy are suppressed, where an individual's impulses are often denied expression, limits flexible thinking. Fourth, weak or ambivalent behavior by the fathers tends to hinder the development of flexible thinking. Similarly, maternal domination and/or father absence also tend to curtail the development of flexible thinking.

The findings of the previously cited studies are relevant, but limited in that: (a) data concerning the fathers' role in childrearing was neglected or obtained from mothers; (b) linearity of relationships was not tested; (c) data collection was restricted to interview and questionnaire techniques; (d) accepted dimensions of parent-child interaction were not systematically included for study.

Method

A flexible thinking factor has been located in fifth grade boys by a factor analysis (Busse, in press). A trend analysis statistic is used in the present study to evaluate

the linear and quadratic relationships between the boys' flexible thinking factor scores and parental behaviors, parental attitudes, and social class.

Subjects

The subjects were forty-eight boys and their mothers and fathers from an almost exclusively lower-class Negro community. The boys attended the three elementary schools in a semi-rural school district. These are the same boys as those used in the flexible thinking factor analysis (Busse, 1967), except that those residing with one or more foster parents were not included. This left forty-nine boys and their parents eligible for the home visits. Forty-eight of these families participated in the study.

The median age of the boys in the forty-eight families studied was 11.3 years with a range of 10.5 to 13.3 years. The mothers had a median age of 36 with a range of 28 to 52 years. The median age of the fathers was 41 with a range of 29 to 61 years.

The boys' median number of full siblings was six. The range was one to thirteen. The boys' median IQ (Total score quotient, Primary Mental Abilities Test) was 78. The range was 53 to 103.

Of the boys, sixteen were born in the South. Likewise, forty-one of the mothers and forty-one of the fathers were born there. Mississippi was the birthplace of slightly more

than one-half of all the parents.

The median number of grades of school completed by mothers was eight; the range was from three to twelve grades. The fathers also finished a median of eight grades; their range was from two to fifteen grades.

Five of the fathers were unemployed at the time of the study; twenty-four worked as laborers; eight worked semiskilled jobs; eight performed skilled jobs; and three held white collar positions.

Measures of Parental Behavior

Situation. The forty-eight mothers and forty-eight fathers were visited in their homes. Each of the parents was asked separately to teach his or her son how to master four tasks. The general methodological situation was adapted from Hess and Shipman (1965). No one except the two participants and the experimenter were present during any of the sessions. The time alloted per task was four minutes. Prior to each task the child was sent out of the room, and the problem was explained to the parent. For the divergent tasks (match problems and unusual uses) the explanation took the form of explaining five answers to the parent. In addition, a cue card listing five solutions to the match problem was provided for the parent's use. The convergent task involved reading over the words to be remembered (word memorization) and explaining the concepts to be taught (concept sorting). The

words to be memorized were typed on a card that could be shown to the boy at the parent's discretion. The experimenter's explanation continued until the parent indicated that he understood the task. Then the parent was informally tested to make certain of his understanding.

Two forms of each task were used. The two forms were designed to be as equivalent as possible in order to permit comparisons between the mother and father data. Specifically, the two sets of ten words for the second task were randomly selected from the total of twenty words. For task four the sixteen concepts were first paired for difficulty. Then one of each pair was randomly assigned to Form A, the other to Form B. For tasks one and three the problems were randomly assigned to either Form A or Form B.

The four tasks were always given in the following order:

1. Match problems (divergent, nonverbal). This task consisted of teaching the child how to work the following type of problem: Form A: "Remove three matches (from the design). Every match you leave must be a part of some square." Form B: "Remove four matches (from the design). Every match you leave must be a part of some square."

2. Word memorization (convergent, verbal). Here the parent had to help the child memorize ten words in order.

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The words for Form A were: tree, roots, showers, spirit, sunlight, wind, song, buds, air, spring. For Form B, the words were: grass, earth, woods, April, leaves, flower, lake, clay, dawn, bird.

3. Unusual uses (divergent, verbal). The parent was required to teach his or her son how to find unusual uses for a particular object. The object for Form A was a paper clip; for Form B, it was a sheet of paper.

4. Concept sorting (convergent, nonverbal). For this task the parent had to teach the child to sort four test objects into one of eight conceptual categories. The eight categories were each represented by two objects possessing a concept in common. The concepts for Form A were: blue, kitchen utensils, wood, cosmetics, plastic, round, tools, involves fire. Form B used the following concepts: transportation, red, metal, rubber, writes, edible, makes noise, rectangular.

Tasks one and three both involve the same type of problems as were administered earlier to the boys for the flexible thinking factor analysis. This similarity was effected in order to allow the boys' test scores to function as covariates when evaluating the effectiveness of parental teaching for a related study. Furthermore, it was thought that the three

month interval between the two administrations would minimize transfer.

A parent taught either all Form A tasks or all Form B tasks. The experimenter intruded into the parent-child interaction only to the extent that he told the parent when to begin teaching. Following a task the boy was tested by the experimenter with a different problem of the same type. The only evaluation by the experimenter of this testing was a noncommital "Good." The data from this testing are not used as a part of this study.

One half of the mothers were randomly assigned to teach Form A and one half, Form B. Likewise, one half of the fathers were assigned to teach Form A and one half, Form B in such a way that all the boys were taught Form A by one parent, and Form B by the other parent.

Scoring. A number of different scores were derived from the sixteen minutes of teaching interaction. The same scores were derived for both mothers and fathers.

While the parent was teaching his or her boy, four nonverbal behaviors were being checked off as present or absent in every fifteen second period. These four nonverbal behaviors were: smiling, frowning, manipulating, pointing. The possible frequency for each nonverbal behavior ranged from zero to sixty-four. These four scores were chosen to reflect nonverbal components of the autonomy-control and

love-hostility dimensions. These are usually considered to be the basic dimensions of the parent-child relationship (Baldwin, Kalhorn, and Breese, 1945; Schaefer, 1959).

The teaching sessions of both the mother and father were tape recorded. The parent and child communication that occurred during each of the four minute tasks was later typed. This transcript was checked by a second person for accuracy.

The number of words used by each of the parents during the four tasks was obtained from the transcript. Also, a ratio of the number of parent words to the number of child words was computed for each parent. The number of parent words was considered to be a measure of participation. The ratio of parent words to child words was chosen as a measure of parental dominance.

Then the parent's behavior in each task was scored to determine whether a sufficient orientation had been given within the first thirty seconds. Criteria, established for each of the four tasks, took the form of asking whether the parent had given the boy enough information to allow him to understand the task requirements. A parent received a score from zero to four depending upon how many sufficient orientations had been given. The sufficiency of orientation

item was chosen in lieu of a direct measure of parental intelligence. The orientation as well as the following items were scored using the transcripts and tape recordings together.

The parent's behavior was also scored in terms of the type of initial approach used in the two divergent tasks, match problems and unusual uses. The initial approach had to take place within the first sixty seconds of a task. Five possible approaches were scored: (a) answer-giving, (b) hinting, (c) autonomous, (d) silent, and (e) unintelligible. A separate score was computed for each of the five approaches. Each score was the number of times out of a possible two that a parent used a given approach. The type of initial approach was considered to be a global reflection of the autonomy-control dimension.

In addition, parental behavior occurring during the four tasks was scored in four sieve categories. These were: (a) Autonomy: Parent asks the child to try the task on his own. (b) Commands: Parent attempts to dominate and directly control the behavior of the child. (c) Love: Parent expresses approval, gives comfort or affection. (d) Hostility: Parent gives explicit negative evaluation of the child's performance, denigrates, or makes sarcastic remarks.

Each category could only be scored once in every fifteen second period. The possible scores in each category

ranged from zero to sixty-four. The four categories were chosen to measure verbal components of the autonomy-control and love-hostility dimensions.

Reliability of the variables. No inter-rater reliability was ascertained for the four nonverbal variables (smiling, frowning, manipulating, and pointing) both because they require very little inference and because of the administrative difficulty of involving another experimenter in the teaching situation. With the exception of frowning, the variables have sufficiently large variances to make prediction from them possible. Because of its small variances, frowning was dropped from all further analyses.

Two raters scored each of the 192 orientations given by the 48 mothers. They disagreed on eleven. Two raters also scored the 192 orientations of the 48 fathers. They disagreed on fourteen. The items on which the raters disagreed were discussed and jointly rescored.

The initial approach items were likewise scored by two raters. Of the 96 initial approaches given by the mothers, nine were scored differently by the two raters. Twelve of the fathers' 96 initial approaches produced disagreement. The items showing differences were discussed and jointly rescored.

Hinting, silent, and unintelligible approaches occurred

only a combined total of nine times for mothers and eight times for fathers. Thus these three categories of initial approach were dropped from further analysis.

Two raters scored each of the protocols of the forty-eight mothers and forty-eight fathers with respect to the four sieve categories. The inter-rater, Spearman rank order correlations for the totals summed over four tasks are uniformly high. Autonomy showed an inter-rater correlation of .92 for mothers and .90 for fathers. Commands showed correlations of .97 for mothers and .96 for fathers. Love showed a higher reliability for the fathers (.87) than for the mothers (.80). Lastly, hostility showed an inter-rater correlation of .77 for mothers and .76 for fathers. The fifteen-second periods that showed differences in these categories were discussed and jointly rescored.

Measures of Parental Attitudes

A selection of items and their reversals from both the mother and father Parental Attitude Research Instrument questionnaires was orally administered to the appropriate-sex parents in the sample (Nichols, 1962; Zuckerman, 1959). Then the items were factor analyzed separately for mothers and fathers. The principal axis factors were rotated to the binormamin criterion of oblique simple structure. Details of these factor analyses are given in Busse (1967).

Six mother factors were located. The factor intercorrelations ranged from .00 to .19. A brief description of each factor follows.

Factor one: dissatisfaction with the homemaking role vs. satisfaction with the homemaking role. The highest loadings were from such items as, "One of the worst things about taking care of a home is a woman feels that she can't get out," and "One of the bad things about raising children is that you aren't free enough of the time to do just as you like."

Factor two: suppression of aggression vs. expression of aggression. Typical items that showed suppression of aggression were: "A good wife never has to argue with her husband," and "Children are actually happier under strict training."

Factor three: martyrdom vs. non-martyrdom. Martyrdom was exemplified by such items as, "A young mother feels 'held down' because there are lots of things she wants to do while she is young," and "Few women get the gratitude they deserve for all they have done for their children."

Factor four: traditional approach to childrearing vs. liberal approach to childrearing. Typical of the items indicating the traditional approach were the following: "The child should be taught to revere his parents above all other grown-ups," and "There is usually something wrong with

a child who asks a lot of questions about sex."

Factor five: intrusiveness vs. non-intrusiveness. The right of a mother to know everything about her child's thinking and behavior dominated the questions loading on this factor. For example, "A mother should make it her business to know everything her children are thinking," and "A mother has a right to know everything going on in her child's life because her child is part of her."

Factor six: control vs. autonomy. On the one extreme the attitude of the mother was to control and shelter the child. At the opposite extreme the mother's approach was to force the child to experience life on his own. Sample items were: "A good mother should shelter her child from life's little difficulties," and "A wise parent will teach a child early just who is boss."

The factor analysis of the father items yielded eight factors. The factor intercorrelations ranged from .00 to .43. A brief description of each factor follows.

Factor one: active role with children vs. ignoring role with children. The active role was typified by items such as: "A child should be protected from jobs which might be too tiring or hard for him," and "Spanking a child immediately when he is cross and nagging is better than

letting him get the habit of acting like that."

Factor two: discouraging physical aggression in children vs. tolerating physical aggression in children. Typical items loading on this factor were: "A good child doesn't fight with other children," and "Children should not be encouraged to box or wrestle because it often leads to trouble or injury."

Factor three: powerlessness vs. powerfulness. This dimension has three facets: first, an attitude of powerlessness toward one's spouse ("The main thing wrong with today's homes is the wife tries too much to run everything."); second, a feeling of general powerlessness toward the world ("The best attitude for a child to learn is to take things as they are."); and third, powerlessness toward one's offspring ("One of the best ways to cure a child's cross and nagging behavior is just to ignore it.").

Factor four: dissatisfaction with family role vs. satisfaction with family role. This factor dealt primarily with the father's enjoyment of his children and, secondarily, his relationship with his wife. For example, "Having to be with the family all the time gives a man the feeling his wings have been clipped," and "The things wives and children ask of a man after his hard day's work are enough to make anyone lose his temper at times."

Factor five: strong marital ties vs. weak marital ties. Typical items showing strong marital ties were: "A man can't do a father's job and have an active social life too," and "Most wives think first of their husbands and only later of children, relatives, and friends."

Factor six: suppression of sex plus strictness vs. normality of sex plus permissiveness. This factor primarily involved the suppression of sexual curiosity in children, but items urging severity in disciplining children also loaded on it. For example, "A well-behaved child isn't curious about sex," and "Some children are just so bad they must be taught to fear adults for their own good."

Factor seven: rigid, absolute standards vs. flexible, sympathetic standards. The rigid extreme of this factor was characterized by such items as, "Children should be taught to enjoy just what they happen to have and not expect to get much more"; "Most of the time it is better if a child is forced to do things without his parents on his side"; and "A parent should never let children get away with anything they aren't supposed to do."

Factor eight: glorification of parents vs. non-glorification of parents. Typical items loading on this factor were: "A parent should never be made to look wrong in a child's

eyes," and "That there is no greater wisdom than that of his parents is something a child soon learns."

Results

The dependent variable in each of the following analyses was the boys' flexible thinking factor scores. The existence of a unified flexible thinking factor was established previously (Busse, in press). The independent variables were parental behavior scores derived from the teaching interaction, factor scores from the mother and father attitude factors, and social class.

Linear and quadratic trend analyses were computed between each of the parent variables and the boys' flexible thinking scores. The trend analysis involved ranking the scores of the forty-eight parents on a particular variable. The scores were then divided into high, middle, and low thirds. These groupings formed the basis for dividing the flexible thinking scores of the forty-eight boys.

The trend analysis statistic was chosen both because some curvilinear relationships were probable, and because the relationships between parent variables and the boys' flexible thinking often were not continuous at the extremes of the parent variables. This latter point made it seem desirable to minimize the effect of extreme scores, which

would have been emphasized by the quadratic term in a multiple regression equation.

Predictions from Parental Behavior

The linear and quadratic Fs indicating the magnitude of the relationships between mother and father behavior variables and the boys' flexible thinking scores are shown in Table 1.

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Insert Table 1 about here

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The significant results for mothers indicate that: First, the amount of manipulation of the task materials showed a quadratic relationship with flexible thinking ($p < .05$). Specifically, mothers who manipulated the materials an average amount had sons who were higher in flexible thinking than those mothers who manipulated the materials either very little or very much. Second, mother commands showed linear ($p < .05$) and quadratic ($p < .10$) relationships with flexible thinking. In particular, mothers using either an average or a great number of commands had sons about equally low in flexible thinking. Third, mothers who pointed an average number of times had sons higher in flexible thinking than mothers who pointed either very little or very much ($p < .10$).

The significant results for fathers are: First, the amount of manipulation of task materials showed a quadratic

relationship with flexible thinking ($p < .05$). That is, fathers who manipulated the materials an average amount had sons higher in flexible thinking than those fathers who manipulated the materials either very little or very much. Second, the greater the number of words spoken by the fathers, the more their sons tended to be high in flexible thinking ($p < .10$). Third, the more verbal expressions of warmth fathers used, the higher in flexible thinking their sons tended to be ($p < .10$).

Predictions from Parental Attitudes

The linear and quadratic Fs indicating the magnitude of the relationships between mother and father attitudes and the boys' flexible thinking scores are shown in Table 2.

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Insert Table 2 about here

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Not one of the mother attitude factors showed a significant relationship to the boys' flexible thinking.

The significant findings for fathers indicate that: First, feelings of powerfulness were linearly ($p < .05$) and quadratically ($p < .10$) related to the boys' flexible thinking. The relationship is such that fathers with strong feelings of powerfulness had sons high in flexible thinking, but that fathers expressing attitudes of either average or low

powerfulness had sons equally low in flexible thinking. Second, fathers who expressed moderate attitudes toward children's fighting behavior had sons higher in flexible thinking than fathers who either abhorred children's fighting or who were very tolerant of it ($p < .05$). Third, fathers who preferred a moderately active role with their children had sons higher in flexible thinking than fathers who preferred either a very active or an ignoring role with their children ($p < .10$). Fourth, fathers who expressed attitudes indicative of flexible, sympathetic standards (vs. rigid, absolute standards) were likely to have sons scoring high in flexible thinking ($p < .10$).

Predictions from Social Class

In addition, linear and quadratic Fs showing the magnitude of the relationships between social class and the boys' flexible thinking scores were computed. Fathers' job status and education were T-scored and summed to provide a measure of social class. A significant linear relationship with the boys' flexible thinking was found ($F = 5.98$, $df = 1/45$, $p < .05$). In particular, boys from "high" (for the present sample) social class homes showed considerably greater flexible thinking than the boys from "middle" or "low" social class homes. There seems to be no difference between the effects of "middle" and "low" social class on the development of flexible thinking.

Discussion

The findings of this study support those from previous research showing that a strong, "masculine" father fosters the development of flexible thinking in boys. This conclusion is supported by the positive linear relationships found between the boys' flexible thinking and (a) a feeling of powerfulness in the father, (b) the number of words spoken by the father, and (c) social class.

Prior studies have found that overprotective, overcontrolling behavior by either parent hinders the development of flexible thinking. However, previous investigators have not tested for nonlinear relationships. In the present study, both linear and quadratic relationships were found between various measures of parental control and flexible thinking.

Two findings support the existence of a linear relationship between parental control and the development of flexible thinking. First, mothers' commanding behavior was found to have a negative linear relationship with flexible thinking. Second, fathers' attitudes expressive of rigid, absolute standards (vs. flexible, sympathetic standards) also showed a negative linear relationship with flexible thinking.

However, additional findings indicate that the relationship between parental control and flexible thinking

might also take a curvilinear form. Similar quadratic relationships were apparent between flexible thinking and mother manipulation, father manipulation, mother pointing, and father attitude factors one and two ("active vs. ignoring role with children" and "discouraging vs. tolerating physical aggression in children").

In particular, mothers who used average amounts of manipulation and pointing, and fathers who used average amounts of manipulation, who preferred a moderately active role with their children, and who expressed moderate attitudes toward children's fighting, had sons highest in flexible thinking. Thus for each of these variables, a moderate "control" position seems to be most effective in fostering the boys' flexible thinking.

The differential findings with various measures of "control" point to the multidimensionality of control. Rank order intercorrelations between the various control measures also support this view (Busse, 1967). Taken together, these findings seem to point to the desirability of minimizing certain aspects of control (e.g., mother commands), while striving for a moderate degree of other facets (e.g., mother and father manipulation).

Previous studies have been unclear on the role that parental warmth and hostility play in the development of

flexible thinking. The findings of this study are generally negative. Only one relevant measure, paternal love, showed a relationship with the development of flexible thinking.

The sufficiency of orientation item was included as a measure of parental "intelligence" on the assumption that more intelligent parents should give more correct and complete orientations. For neither parent does this variable show any relationship to the boys' flexible thinking. Thus this type of measure of parental "intelligence" can be ruled out as a contributor to flexible thinking variance.

Although only thirteen of seventy-four statistical tests performed reached significance, it should be noted that a number of parental behavior variables which did not significantly predict flexible thinking were highly related to one another because of scoring artifacts (e.g., mother answer-giving approach and mother autonomous approach). Thus the number of independent tests of the type used that could be performed on this data is somewhat less than seventy-four.

Post-hoc theorizing on the limitations of the present research suggests that situational variance probably contributes a great part of the total variance in measured parental behavior. It is also possible that parental behavior variables other than those tested in this study

might be linked to flexible thinking. Then again, many specific environmental factors may be operating with each one contributing only a small percentage of the total variance. In addition, it is known that heredity plays a major role in determining flexible thinking variance (Corah, 1965; Stuart, Breslow, Brechner, Ilyus, and Wolpoff, 1965).

Finally, it is important to remember that studies of this nature have several important limitations: First, parental behaviors toward a particular child are assumed to remain relatively stable from birth till the child reaches ten or eleven. Second, it is assumed that the parental behaviors sampled are a reasonably accurate approximation of their "real life" counterparts. And third, this type of study cannot draw conclusions about the direction of influence: relationships might as logically be ascribed to parental responses to the child, as to the child's reaction to parental behaviors.

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Footnotes

[1]This study is based on a dissertation submitted to the Department of Education of the University of Chicago. The study was also done as a project of the Institute for Juvenile Research.

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Table 1

Relationship of Parental Behavior to the Boys' Flexible Thinking

Parental behavior variables	Mothers		Fathers	
	Linear F	Quadratic F	Linear F	Quadratic F
Smiles	2.30	1.24	.11	.64
Manipulates	2.27	5.17**	.99	4.76**
Points	.29	2.94*	.59	.18
Total words	.03	.01	3.21*	2.09
Ratio of parent words to child words	.43	1.47	.05	2.19
Orientation	.21	.07	.07	.08
Answer-giving approach	.65	.99	.12	.56
Autonomous approach	.72	1.02	.50	.12
Autonomy	1.62	.64	.35	.10
Commands	4.40**	3.43*	.03	.03
Love	1.89	.25	3.16*	.47
Hostility	.00	.02	1.06	.08

* $p < .10$ for 1/45 df
** $p < .05$ for 1/45 df

Table 2

Relationship of Parental Attitudes to the Boys' Flexible Thinking

Attitude factors	Linear F	Quadratic F
Mothers		
1. Dissatisfaction with the homemaking role	1.01	.50
2. Suppression of aggression	2.45	1.07
3. Martyrdom	.06	.08
4. Traditional approach to childrearing	.01	.30
5. Intrusiveness	.37	.97
6. Control	1.39	.21
Fathers		
1. Active role with children	.02	3.69*
2. Discouraging physical aggression in children	.21	4.95**
3. Powerlessness	6.96**	2.91*
4. Dissatisfaction with family role	.33	.12
5. Strong marital ties	.02	.42
6. Suppression of sex plus strictness	1.44	.84
7. Rigid, absolute standards	3.39*	.26
8. Glorification of parents	.82	.10

* $p < .10$ for 1/45 df
** $p < .05$ for 1/45 df